EXPLANATION OF THE PLATES.

Plate IX.

Fig. 1. First stage of development of *Pagurus**.

Fig. 2. Second stage. The author gives this with the reservation stated, having taken it swimming in the open sea. c, dorsal view of cephalon; *a*, eye; *b*, superior antennæ; *c*, inf. ant.; *d*, mandible; *g*, posterior maxilliped; *h*, first pair of gnathopoda; *l*, second pair; *k*, first pair of pereiopoda; *l*, *m*, *n*, *o*, three posterior pairs of pleopoda; *p*, *q*, *t*, pleopoda; *u*, sixth pair of pleopoda; z, telson.

Fig. 3. Third stage, representing the genus *Glaucothoë* of Milne-Edwards and *Prophylax* of Latreille: *n*, penultimate pair of pereiopoda; *o*, ultimate pair of pereiopoda; *p*, a pleopod; *u*, sixth or posterior pair of pleopoda; z, telson; p, pleon of an older specimen.

Fig. 4. Zoëa of *Porcellana platycheles*: *z*, telson.

Plate X.

Fig. 1. *Phyllosoma.*

Fig. 2. Zoëa of *Palinurus marinus.*

Plate XI.

Fig. 1. *Typton spongiosus*, n. sp. References as above.

Fig. 2. *Alpheus Edwardsii.*

Fig. 3. Mandible of *Nika edulis.*

Fig. 4. *Homarus marinus.* Development of flagellum to lower antenna.

Fig. 5. *Tanais*: *h*, first pair of gnathopoda, with branchial appendage attached.

XI.—*Observations on some of the* Heliotropieæ.

By John Miers, F.R.S., F.L.S., &c.

In the 'Prodromus' of De Candolle we find the order *Borragineæ* divided into four distinct tribes, the *Cordieæ*, *Ehretieæ*, *Heliotropieæ*, and *Borrageæ*. Long before the appearance of that work, the late Mr. R. Brown had pointed out, in his 'Prodromus,' p. 492, that the *Cordieæ* ought to be held as a distinct family, on account of their 4-fid style, and their seeds without albumen, with plicated cotyledons—an opinion supported by Endlicher and Lindley for reasons which appear sufficiently valid. Von Martius rightly held that the perfectly gynobasic style, placed in the middle of four distinct ovaries, entitled the *Borrageæ* to rank as a separate natural order, and accordingly he combined the two remaining tribes of DeCandolle, the *Ehretieæ* and *Heliotropieæ*, in another family, which he designated with the name of *Ehretiaceæ*. The uncertainty and confusion in the distribution of the species in these several groups have in great measure arisen from a neglect to examine the structure of the fruits; it may, however, be taken as a rule that among the whole of them it is essential that the seeds

* This was taken so young from the ovum that I am not certain whether the long projecting rostrum is a feature or not, as at this period it is generally folded under.

should be suspended and solitary in their respective cells, with a superior radicle. But it is important to notice that Gaertner distinctly attributes to *Beurreria*, and figures, a 4-carpellary fruit, with seeds having an inferior radicle; and Kunth describes his South-American species of *Ehretia* (formed into the genus *Amerina* by De Candolle) as having a unilocular ovary, with four ovules attached to two bifid opposite parietal placentæ—structures only reconcileable with *Verbenaceæ*: indeed De Candolle appeared so far disposed to adopt this view that he suggested the latter genus might be allied to *Tectona*. *Amerina*, however, appears much nearer *Citharexylon*, with which it agrees in its tubular persistent calyx, its cylindrical 5-lobed corolla, with five exserted stamens, the ovary and seed being formed as above indicated, having also an arborescent habit with opposite leaves. The doubts that have been thrown upon the truth of Kunth's observations concerning *Amerina* and of Gaertner's regarding *Beurreria* are only inferences founded upon analogy; but no one has yet shown by actual examination that the statements of those botanists are contrary to fact.

It is difficult to draw a line of distinctive characters between the *Ehretieæ* and *Heliotropieæ*: some have suggested a suffruticose habit in the former, and a subherbaceous one in the latter; but these characters are too variable to be of use: others have urged the presence of albumen and a bifid style in the former, and the want of albumen with an undivided stigma in the latter; but the former character has been denied to *Ehretieæ* by De Candolle, and I have to show the existence of a deeply cleft stigma in *Heliotropieæ*. De Candolle places *Tournefortia* in *Ehretieæ*; Fresenius, who has elaborated the Brazilian *Borragineæ*, ranks that genus in *Heliotropieæ*, and with reason. To the latter tribe, again, has been assigned the distinctive character of a scorpioid spicated inflorescence; but that character is rendered nugatory by the presence of solitary axillary flowers in *Coldenia* and in many species of *Schleidenia*, and of several congested single axillary flowers in *Tiquilia*. There remains, therefore, scarcely a tangible uniform character that can mark the limit between *Ehretieæ* and *Heliotropieæ*.

In regard to *Ehretia* I will not venture to offer any decided opinion, because I have had no opportunity of examining its species; but we are evidently much in the dark concerning its real structure. All authors agree in attributing to *Ehretia* a 4-locular ovary with a slender simply 2-fid style, a single ovule suspended from the summit of each cell, and a baccate fruit enclosing a 4-celled nut, or two nucules, each 2-celled. But Dr. Wight, in his 'Icones,' pls. 1382 & 1383, figures in *Ehretia* a bifid style upon an ovary which is 1-locular, with

two opposite bipartite parietal placentæ, each fork bearing a single ovule, as in *Ægiphila* and *Amerina*. If these figures be correct, as there is no reason to doubt, these species cannot belong to *Ehretia*, or else the characters of the genus have been erroneously defined, and the tribe itself has been placed in a wrong family. These discrepancies show that we have yet much to learn in regard to the *Ehretieæ*. If we hold *Beurreria* still in doubt, as well as *Amerina*, for the reasons before given, there will remain only *Ehretia* itself to represent the tribe; and this offers so many anomalous characters that DeCandolle considered it must ultimately be divided into several genera, of which he traced the outlines in *Beurreria*, *Carmona*, *Xerodema*, and *Menais*. *Xerodema* has been shown to be identical with *Rhabdia*, a Brazilian genus minutely and accurately described by Prof. von Martius in his 'Nova Genera,' and since figured by Sir Wm. Hooker (Icon. 823). This construction, of a 1-locular ovary, with two opposite 2-lamellar placentæ bearing an ovule on each of their reflected margins, and a fruit with four nucules, each with a longitudinal open slit leading into two cells, is quite at variance with the structure that has been attributed to *Ehretia* and its allied genera. I will offer some observations upon *Rhabdia* and *Cortesia* under separate notices.

The following is a synopsis of the genera of the *Heliotropieæ*:—

1. Fructus baccatus; albumen distinctum.
   A. Pyrenæ 2, singulæ 2-loculares.
      a. Embryo rectus; stamina inclusa; stylus brevis; stigma latum, breviter 2-lobum ..... *Tournefortia.*
   B. Pyrenæ 4, singulæ 1-loculares.
      b. Embryo lunatim curvatus; corollæ laciniæ subulatæ; stamina inclusa; stylus longiusculus; stigma majusculum, apice conico, piloso ..... *Messerschmidtia.*
2. Fructus exsuccus; albumen distinctum, aut nullum.
   C. Pyrenæ 2, singulæ 2-loculares; stamina inclusa.
      c. Stigma breve, vix divisum; albumen nullum .... *Heliophytum.*
      d. Stigma magnum, elongatum, profunde 2-fissum; albumen distinctum ..... *Cochranea.*
   D. Pyrenæ 2, singulæ 2-loculares.
      e. Stamina longe exserta; stylus tenuis; stigma tenuiter 2-fidum ..... *Tiquilia.*
   E. Pyrenæ 4, singulæ 1-loculares.
      f. Antheræ apice papilloso cohærentes; stylus brevis aut subnullus; stigma magnum; flores interdum solitarii et axillares ..... *Schleidenia.*
      g. Antheræ glabræ, oblongæ, liberæ; stylus mediocris; stigma magnum; flores in spicas longas curvatas terminales, 1-laterales ..... *Heliotropium.*
      h. Antheræ glabræ, globosæ, liberæ; stylus simplex, 2-fidus; flores axillares, solitarii ..... *Coldenia.*

Pentacarya, Hook. & Arn., and *Euploca*, Nutt., appear to be foreign to this group. *Piptoclaina*, Don, differs little from *Heliotropium*, except in its four broadly margined 1-celled nuts, frequently reduced to two by abortion; it has five distinct sepals (not a tubular 5-toothed calyx, as Don states); it has the habit of *Coldenia*, but with terminal solitary spikes. *Halgarnia*, Gaud., also appears alien to this group, because of its campanular calyx and its incompletely 2-celled ovary with two pairs of collateral ovules suspended from two semiseptiform placentæ. As the genera *Cochranea* and *Messerschmidtia* hitherto appear almost unknown, I will here define them and note their species.

Cochranea.

This genus, proposed by me in 1825, upon a Chilian plant, was afterwards described as a variety of the *Heliophytum stenophyllum*, Hook. & Arn. It differs from *Heliophytum* in the peculiar habit of the plants (being short, erect, branching shrubs); they have more woody (not fistulose) branches, which are generally covered with numerous very fasciculated linear leaves; the genus also is remarkable for its very large elongated stigma, two or three times the length of the style, or even longer, having a broad annular peltate enlargement at its base, and cleft at the summit, generally halfway down, into two narrow subulate segments, which are entire, or more rarely 2-denticulated. The fruit consists of two bilocular nucules, as in *Heliophytum*; but they have not the same deep vacuities on the inner face, and the seeds are enveloped in a distinct albumen. The inflorescence is not in long, solitary or geminate spikes, as in *Heliophytum*, but is corymbosely branched, at first in subglobose heads, afterwards becoming more spread.

Cochranea, nob.;—*Heliotropium* et *Heliophytum* in parte auct.—*Sepala* 5, lanceolata, erecta, plus minusve pilosa, æstivatione imbricata, persistentia. *Corolla* hypocrateriformis, *tubo* cylindrico vel supra medium paulo infundibuliformi, fauce plicis 5 angustato, sub-5-gono, nervis 5 crassis a medio loborum in angulis tubi decurrentibus et intra faucem sæpe glandulis totidem munitis, *limbo* expanso, vix ad medium 5-lobato, lobis rotundatis cum plicis totidem alternantibus, æstivatione valde imbricatis. *Stamina* 5, inclusa, fere sessilia, tubi dimidia longitudine: *filamenta* brevissima, circa medium tubi affixa; *antheræ* lanceolatæ, 2-lobæ, mucronatæ, imo breviter auriculatæ, in sinu dorsaliter affixæ, erectæ, utrinque rima laterali dehiscentes. *Discus* parvus, hypogynus, margine crenulatus. *Ovarium* in hoc impositum,

subglobosum, 4-sulcatum, 4-loculare, loculis *ovulo* solitario suspenso munitis: *stylus* teres, superne paulo incrassatus; *stigma* inclusum, valde elongatum, imo annulo crasso cinctum, sursum attenuatum, plus minusve profunde 2-fissum, laciniis subulatis, integris, vel 2-denticulatis. *Fructus* exsuccus, globosus, profunde 2-sulcatus, calyce persistente inclusus; *nuculæ* 2, semiglobosæ, marginibus rotundatis, facie subplana, foraminulo obsoleto incavatæ, osseæ, singulæ 2-loculares, loculis 1-spermis. *Semen* ovatum, apice suspensum; *integumenta* tenuissima; *albumen* parcum, carnosum; *embryo* orthotropus, *cotyledonibus* ovatis, subcompressis, carnosulis, *radicula* tereti ad summum spectante duplo longioribus.

Suffrutices *Chilenses*, *dumosi*, *odore balsamico scatentes*, *ramosi*; ramis *sæpe virgatis*, *valde foliosis*; folia *in axillis alternis plurima*, *fasciculata*, *sæpius anguste lineares*, *marginibus interdum valde revolutis*: panicula *terminalis*, *primum subcapitata*, *demum expansa*, *valde ramosa*, *ramis breviter divisis et spicatifloris*; flores *parvi*, 1-*laterales*, *sessiles*, *ebracteati*.

1. *Cochranea conferta*, nob. Trav. Chile, ii. 529;—Heliophytum stenophyllum, var. rosmarinifolium, *DC. Prodr.* ix. 552; *Gay, Chile*, iv. 456;—ramis strictiusculis, erectis, breviter pauciramulosis, in junioribus viscoso-pilosulis, demum glabris, confertissime imbricatim foliosis; foliis in axillis alternis, plurimis et fasciculatis, anguste linearibus, imo spathulatis, sessilibus, marginibus valde revolutis, supra subrugulosis, glabris aut obsolete puberulis, subtus parce rigido-pilosis: paniculis terminalibus, corymbosis; ramis alternis 3–4, spicas plurimas alternas gerentibus; floribus sessilibus, uniserialibus; stigmate stylo 2-plo longiore, fere ad medium 2-fido, laciniis subulatis, obtusulis.—In Chile: *v. v.* ad Cuesta larga de Llaillay; *v. s. in herb. variis* (Cuming, 377; Bridges, 235); *in herb. Hook.*, Coquimbo (Harvey), ex Mus. Paris. Chile (Gay).

I found this plant in 1822 in the province of Quillota, where it is frequent upon the lofty hills, forming a bushy shrub from 3 to 5 feet in height. Its erect branches are densely covered with crowded, imbricated leaves, fasciculated in the approximated axils; they are 14–18 lines long, ½ line broad. The terminal inflorescence, when fully developed, has a main peduncle 1½–2 inches long, bractless, expanding into three or four alternate branchlets, 9 lines long, bearing many crowded sessile flowers arranged unilaterally in a spike; the sepals are 1¼ line long, obtusely subulate, glabrous, with ciliated mar-

gins; the tube of the corolla is 2 lines long, glabrous, with five glands in its mouth; the border is $2\frac{1}{2}$ lines in diameter, white, with red nervures, becoming pink when faded; the stamens, half the length of the tube, reach its mouth; the ovary is 4-grooved, seated on a crenulated disk; the style is about the same length; the stigma, double that length, is annulated at its base, conical, and simply 2-fid to nearly its middle*.

Var. *auriculata*;—caulibus erectis, rugosis; foliis creberrime divaricatis, imbricatim tectis; ramulis paucis, fuscis, granulato-papillosis; foliis in axillis approximatis circiter 10, longe linearibus, sessilibus, imo latioribus et subauriculatis, marginibus subsinuatis, subrevolutis, supra glabris: paniculis terminalibus, corymbosis; stigmate stylo æquilongo, apice 3-dentato.—In Chile: *v. s. in herb. Hook.* (Lobb, 442).

A plant with the habit of *C. congesta*, differing in its more crowded, more divaricated, longer leaves. It is probably a distinct species intermediate between *C. congesta* and *C. sinuata*, differing extremely from the latter in its habit, its longer, narrower, and more crowded leaves. The leaves (generally eight or ten in each approximated axil) are $1\frac{1}{2}$–2 inches long, 1 line broad, quite glabrous above, with subsinuated margins, are minutely puberulous or pulverulent below, when examined under a strong lens; the peduncle and its branches are pubescent; the acute-lanceolate sepals are pilose on both sides; the cylindrical tube of the corolla is angular and pilose; the stigma (rather longer than the style) is somewhat conical, and 3-denticulated at its apex. In Bridges's No. 1838, referred by De Candolle to *H. myosotifolia*, where I have placed it, the stigma is invariably as I have there described it; but here it is constantly 3-lobed or imperfectly 4-denticulate, as De Candolle mentions. There is probably some confusion in the specimens.

2. *Cochranea corymbosa*, n. sp.;—valde ramosa; ramis brunneis, rugosis; ramulis longis, adscendentibus, subflexuosis, epidermide rubente laxa rimosa nitente vestitis; foliis majoribus fasciculatis, late lanceolatis, acumine brevi obtusulo, in petiolum longum imo dilatatum sensim cuneatis, planis, submembranaceis, tenuissime nervosis, utrinque subglabris, rugulosis, versus marginem et in costa subscabrido-pilosis: paniculis in ramulis terminalibus, corymbosis, glabris; pedunculo longissimo, compresso, rubente, nitido, superne alternatim et subremote ramoso; ramulis apice bis

* A drawing of this plant, with ample analytical details, will be shown in Plate 53 A, in the second volume of my 'Contributions.'

dichotome divisis, ultimis tenerrimis, unilateraliter spicatifloris; floribus majusculis, inferioribus breviter pedicellatis, reliquis sessilibus; sepalis lanceolatis; stigmate stylo æquilongo, conico, fere ad basin 2-fisso, laciniis subulatis, obtusulis.—In Chile: *v. s. in herb. Mus. Brit. et Hook.*, Coquimbo (Bridges, 1341).

This species is at once distinguished from all the others by its much larger, flat, submembranaceous leaves. It seems to be a low-growing shrub with ascending branches, with branchlets 3–4 lines apart, which are subangular, subcompressed, 4–6 inches long, with axils 4–6 lines apart, which are somewhat nodose; the leaves (including the petiole, 7 lines long and ½ line broad) are 2 inches long, 3–3½ lines broad, the narrow petiole being somewhat enlarged at its insertion upon the node; within this, three or four shorter leaves are fasciculated in each axil; they are all nearly glabrous. The terminal peduncle is 4 inches long, bearing at intervals of 3 to 9 lines several branches 6–12 lines long, each divided into two unilateral spikes 1½ inch long, bearing sessile flowers 2 lines apart; the sepals, almost glabrous outside, are pubescent within and on the margins, are 2 lines long, acutely lanceolate; the tube of the corolla is 3 lines long, ½ line broad, with a border 5 lines in diameter; the anthers, 1 line long, are inserted 1¼ line above the base; the pistil is the length of the sepals, the style being rather longer than the stigma, and twice the length of the ovary.

3. *Cochranea sinuata*, n. sp.;—subdichotome et tortuose ramosissima, ramis ramulisque glabris, epidermide laxa fusca rimosa vestitis, junioribus pilosulis; foliis in axillis plurimis, fasciculatis, linearibus, apice rotundatis, imo in petiolum angustum longe spathulatis, marginibus undulato-sinuatis, sæpe subrevolutis, submembranaceis, supra rugulosis, in nervis impresso-sulcatis, obsolete pilosis, subtus pallidioribus, plus minusve cano-pilosis: paniculis terminalibus, subcorymbosis, alternatim ramosis, ramis geminatim divisis et spicatifloris; stigmate stylo paulo longiore, imo annulato, conico, granulatim viscoso, ad medium 2-fisso, laciniis 2-denticulatis.—In Chile: *v. s. in herb. Mus. Brit.*, Coquimbo (Bridges, sine num°.); *in herb. Hook.*, Coquimbo (Bridges, 1342).

This is evidently a low-growing shrub, with erect branches, which, in the lower portions, are nearly bare of leaves, very rough, with tortuous branchlets again divided, the younger ones being 5 or 6 inches long. The leaves are 9–14 lines long

(including a petiole of 3 lines), 1½–2 lines broad, with very sinuous and undulated margins. The many approximated floriferous branchlets form a large corymbose head: each terminal panicle has a peduncle 4 lines long, with four alternate branches 3–4 lines apart, 4 lines long, each divided into two spikes 1½ inch long; the sepals are 1 line long, oblong, obtuse, pilose outside; the tube of the corolla is 1½ line long, with a border 4 lines in diameter; the pistil is 1 line long, the stigma being a little longer than the style.

4. *Cochranea stenophylla*;—Heliophytum (Heliotropium) stenophyllum, *Hook. & Arn. Beech. Voy.* 66; *DC. Prodr.* ix. 552; *Gay, Chile*, iv. 456;—caulibus erectis, longiusculis, vix flexuosis, subnudis, nodis prominulis ruderatis, superne valde ramosis, ramulis plurimis, alternatim approximatis, divaricatis, griseis, glabris, paucifoliosis et puberulis; foliis fasciculatis vel rarius solitariis, linearibus, utrinque attenuatis, crassiusculis, supra breviter sparsim tuberculato-pilosis, subtus adpresse hirtulis: paniculis terminalibus, subcorymbosis, pilosis; pedunculo ramos 3–4 alternos breves spicatifloros gerente; floribus majusculis, crebriter sessilibus; stigmate stylo æquilongo, imo incrassato, conico, fere ad basin 2-fido, laciniis 2-dentatis.—In Chile: *v. s. in herb. Mus. Brit. et Hook.*, Coquimbo (Bridges, 1340).

These specimens have a somewhat flexuous knotty stem, 1 foot long, above which they throw out several close ascending branches, 4–10 inches long, with several divaricating branchlets, at distances of 6–9 lines, and about 4 inches long. The leaves are 5 lines long, ¾ line broad; the terminal peduncle, 6–9 lines long, bears three alternate short curving spikes, each with about six flowers, all forming a corymbulose head; the sepals, 1¾ line long, ½ line broad, are linear, pilose on both sides; the tube of the corolla is 2 lines long, a little swollen in the mouth, pilose on its angles, with a border 4 lines in diameter; the pistil is 1½ line long, the stigma as long as the style, cleft for nearly half its length into two obtuse segments, which are minutely 2-denticulated at their apex.

The original typical specimen is not to be found in the Hookerian herbarium.

5. *Cochranea myosotifolia*;—Heliophytum stenophyllum, var. myosotifolium, *A. DC. Prodr.* ix. 552; *Gay, Chile*, iv. 456;—ramosum, ramis subtortuosis, irregulariter diffusis, crebre nodosis, epidermide rimoso, griseo; ramulis teretibus, griseo-puberulis; foliis in axillis alternis, plurimis, fasciculatis, linearibus, imo paulo attenuatis, apice obtusulis, utrinque

adpresse scabrido-pilosis, marginibus subrevolutis; inflorescentia terminali, pubescente; pedunculo 2-fido, in ramos dichotome spicatifloros diviso; floribus crebriter sessilibus; stigmate stylo brevissimo 8-plo longiore, imo incrassato, sursum acutissime conico, ad medium 2-fisso, laciniis subsetaceis.—In Chile: *v. s. in herb. Mus. Brit.*, Coquimbo (Bridges, 1338).

This appears to be a low straggling shrub, with irregularly spreading branches covered with a glabrous splitting epidermis; the lower ones are knotty, with prominent leafless nodes; the upper branches are terete and pubescent, with axils 2–6 lines apart. The leaves are 8 lines long, 1 line broad; the peduncle of the terminal inflorescence is 9 lines long, its branches 3–4 lines long, each bearing two short spikes, all forming a corymbose head; the sepals are 2 lines long, acutely linear, pilose on both sides; the tube of the corolla is $1\frac{3}{4}$ line long, somewhat larger about the mouth, and pilose outside, with a border $3\frac{1}{2}$ lines in diameter, with five radiating, broad, coloured nervures; anthers 1 line long, reaching the mouth; pistil $1\frac{1}{2}$ line long, the ovary, style, and stigma being in the proportions of 3 : 1 : 8.

6. *Cochranea florida*;—Heliophytum floridum, *A. DC. Prodr.* ix. 553;—Heliotropium floridum, *Gay, Chile*, iv. 457;—e basi ramosissima, ramis subangulatis, ramulisque crebris, rufescentibus, glabris; foliis linearibus, obtusis, imo angustissime spathulatis, planis aut marginibus vix revolutis, utrinque subrugulosis, fere glabris aut versus margines obsolete pilosis: paniculis terminalibus, corymbosis, 1–3-ramosis, ramis spicatifloris; floribus sessilibus, majusculis; stigmate stylo fere æquilongo, imo annulato, apice 2-fisso, laciniis 2-dentatis.—In Chile: *v. s. in herb. Hook.*, Coquimbo (Cuming, 858; Bridges, sine num°.); ex Mus. Paris. (Gay).

A low-growing shrub, with suberect or decumbent stems, with ascending, very approximated branches, covered with a lax, reddish, shining epidermis; leaves 8–10 lines long, 1–$1\frac{1}{2}$ line broad, decurrent on a petiole of one-fourth their length; peduncle of terminal inflorescence 1 inch long; its branches, 3 or 4 lines apart, are bare at base, spicated unilaterally, with few sessile flowers; the acutely lanceolate sepals, pilose on both sides, are $2\frac{1}{2}$ lines long; the tube of the corolla is pentagonous, glabrous, 3 lines long, the expanded border 5 lines in diameter; the stamens occupy the upper half of the tube; the pistil is $2\frac{1}{2}$ lines long; the conical stigma, annular at base, is cleft for one-third or one-fourth of its length into two segments,

2-denticulate at their apex. In Bridges's specimen the flowers are paler and smaller, and the leaves narrower.

7. *Cochranea hebecula*, n. sp.;—ramosissima, ramis griseis, creberrime ramulosis, ramulis junioribus dense sericeo-pubescentibus, incanis; foliis fasciculatis, oblongo-linearibus, imo in petiolum angustissime spathulatis, apice rotundatis aut obtuse attenuatis, carnosulis, subplanis, utrinque incano-pilosulis, eveniis: paniculis corymbosis, terminalibus, 2–3-spicatis; floribus majusculis, 1-serialibus; stigmate stylo 6-plo longiore, 2-fido, laciniis 2-denticulatis.—In Chile: *v. s. in herb. Mus. Brit.*, Coquimbo (Bridges, sine num°.).

This appears to be a bushy plant, with knotted branches 3 lines thick, divided at their summit into numerous very close leaf-bearing ramifications, 8–10 inches long, with branchlets 4–6 inches long; the axils are 3–6 lines apart; the leaves 8–12 lines long, 1 line broad; the terminal peduncle is 6 lines long, sometimes bearing a single spike, 2 inches long, or with two or three alternate spicated branches 3–4 lines apart, much shorter, bearing a few large flowers 1 line apart; calyx 1 line long, cleft nearly to the base, where it is shortly cupuliform, with five acutely oblong segments, densely pilose on both sides; the tube of the corolla $1\frac{1}{4}$ line long, 5-gonous, somewhat pilose outside, with a border 4 lines in diameter; pistil somewhat longer than calyx; stigma annular at base, six times as long as the style, cleft for one-third of its length into two broadish bidenticulate segments.

8. *Cochranea ericoidea*, n. sp.;—ramosissima, ramis ramulisque tenuissimis, divergentibus, pallidis, glaberrimis aut molliter puberulis, axillis cupula brevissima obtusa prominula foliigera munitis; foliis pluribus, fasciculatis, parvis, linearibus, sessilibus, apice callosis, carnosulis, enerviis, supra pilis rigidulis, imo tuberculatis scabridulis, subtus costa et marginibus subrevolutis scabridule hirtellis: paniculis terminalibus, pilosis, sæpius geminatim spicatifloris; floribus sessilibus, minoribus; stigmate longissimo, incluso, 2-fido, laciniis obtusis.—In Chile: *v. s. in herb. Mus. Brit. et Hook.*, Coquimbo (Bridges, 1339).

This appears to be a low straggling shrub, with very slender divaricating branches, having much the habit of an *Aloysia*; the lower branches are quite smooth and bare; the foliiferous branchlets are very slender, scarcely more than $\frac{1}{4}$ line in thickness, nodose at the axils, with a very short obtuse spine, produced by the persistent base of the midrib of the exterior leaf: out of these cupular nodes, which are 2–3 lines apart,

three or four leaves spring, which are 3–5 lines long: the peduncle is 2–3 lines long, with geminate or three alternate spikes 3 lines apart, 1–1½ inch long, rigidly and shortly pilose; the sessile flowers are 1–2 lines apart; the sepals, ¾ line long, are connate at base into a short cup, with oblong segments, callous at the apex, fleshy, pale green, pilose on both sides; tube of corolla 1 line long, wider and pilose above, with a border 2 lines in diameter; pistil the length of tube of corolla, with a subglobose sulcated ovary seated on a 10-lobed disk; the stigma, annular at base and as broad as the ovary, six times as long as the style, tapering to an obtuse point, cleft for a quarter of its length into two obtuse segments.

9. *Cochranea filifolia*, n. sp.;—ramosissima, ramis teretibus, nodosis, epidermide grisea rugulosa tectis, striatellis; ramulis alternatim approximatis, subadscendentibus, glabris, junioribus papilloso-tomentosis; foliis in axillis, plurimis, inæqualibus, fasciculatis, rarius solitariis, spathulato-linearibus, parvis, crassiusculis, granuloso-rugosis, divergentibus: paniculis floribundis, in ramulis terminalibus, glanduloso-puberulis; pedunculo bis dichotome diviso, ramis ultimis tenuibus, spicatifloris; floribus sub-2-seriatis, remotiusculis, sessilibus; sepalis brevibus, extus farinaceo-leprosis; stigmate imo lato, conico, profunde 2-fido, laciniis obtuse 2-dentatis.—In Chile: *v. s. in herb. Mus. Brit. et Hook.*, Coquimbo (Bridges, 1343).

These specimens of Bridges's collection, though under the same number as *C. chenopodiacea* in M. de Boissier's herbarium, are specifically very distinct from it. The plant is everywhere covered with a resin-like minute granulation; the leaves are more than twice the length and narrower than those in the species referred to: it is somewhat ericoid in its habit, with the young branchlets terete, fulvous, and rugulose, 6–8 inches long, with axils 3–4 lines apart. The leaves are 3–6 lines long, ½ line broad. The peduncle of the terminal inflorescence is ¾–1 inch long, twice dichotomous, the ultimate branches spicated, 2 inches long, with about eight rather large sessile flowers, 3–4 lines apart, all forming a corymbose panicle; the sepals are ¾ line long, obovate, obtuse, erect, fleshy, covered with whitish leprous scales, glabrous within; the tube of the corolla is cylindrical, 1 line long, the border being 3–4 lines in diameter; the ovary, subglobose, 4-grooved, is seated on a lobed disk; the stigma is six times as long as the very short style, has a basal ring broader than the ovary, is shortly conical, obtuse, cleft halfway into two obtuse 2-dentate seg-

ments : the fruit, consisting of two nuts enclosed in the persistent calyx, is polished and glabrous.

10. *Cochranea hispidula*, n. sp. ;—crebre ramosissima, ramis subrugoso-striatis, ramulis subdivergentibus, teretibus, brunneis, pilosis ; foliis fasciculatis, sessilibus, spathulato-linearibus, obtusis, marginibus valde revolutis, carnosulis, fusco-viridibus, undique hispidulis ; paniculis in ramulis terminalibus, brevibus, bis dichotome divisis, pubescentibus ; ramis ultimis 2-seriatim spicatifloris ; floribus paucis, crebris, sessilibus ; stigmate stylo 6-plo longiore, apice 2-fido, laciniis 2-dentatis.—In Chile boreali : *v. s. in herb. Hook.* (Lobb, 440).

This is evidently a low-growing shrub, with extremely crowded, elongated branchlets, 3–4 lines apart, 8 or 9 inches long, the lower ones again branching, the upper ones simple : the axils are 3 lines apart ; the leaves are 4–6 lines long, ½ line broad. The peduncle of the inflorescence is 6 lines long, its branches 6 lines long, their ultimate 2- or 3-spicated branchlets being 9 lines long ; the calyx is tubular, cleft halfway into five erect teeth, is pubescent on both sides, 1 line long ; the tube of the corolla is 1 line long, pubescent outside, with a border 2 lines in diameter ; the pistil is 1 line long ; the stigma, eight times the length of the style, annular at base, slenderly conical, cleft for a quarter of its length into two bidentate segments.

11. *Cochranea chenopodiacea*;—Heliophytum chenopodiaceum, *A. DC. Prodr.* ix. 553 ;—Heliotropium chenopodiaceum, *Gay, Chile*, iv. 458 ;—nana, divaricato-ramosissima, glabella ; ramulis subrigidis, teretibus, flavidulis, junioribus obsolete puberulis ; axillis cupula prominente munitis ; foliis fasciculatis, parvis, spathulato-linearibus, subteretibus, marginibus valde revolutis, carnosulis, fere sessilibus, glabris vel subviscosis : paniculis terminalibus, bis dichotome divisis, ramis ultimis tenuibus, spicatifloris ; floribus paucis, sessilibus, pallide cæruleis ; calyce tubuloso, 5-dentato, extus pilosulo ; stigmate stylo 2-plo longiore, apice obtuso, breviter bifido.—In Chile : *v. s. in herb. Hook. ex Mus. Paris.*, prov. Copiapo, ad montes Arqueros (Gay).

This plant was found by Gay in the more northerly province of Copiapo, in the silver-mining district of Arqueros, and is distinct from the plant I have referred to *C. filifolia*, which has been confounded with it. Gay says it is a low shrub, not more than a foot high, with many short stiff spreading branches, which are terete, covered with a yellowish,

shining epidermis. The fasciculated leaves are very small, somewhat glutinously rugulose, 1 or 2 lines long, scarcely ¼ line broad; the terminal inflorescence has its spicated branchlets 6 lines long; the calyx is broadly tubular, 1 line long, cano-pubescent outside, divided halfway into five triangular teeth; the tube of the corolla is a trifle longer than the calyx, cylindrical and pilose outside; the pistil is as long as the tube of the corolla; the ovary semiglobose, seated upon the disk; the stigma, annular at base, is rather longer than the style, conical, and divided at its apex into two short obtuse segments. The glabrous fruit consists of two nucules, each 2-celled.

[To be continued.]

XII.—*On* Phidiana lynceus *and* Ismaila monstrosa.

By Dr. Rud. Bergh*.

[Plate I.]

The genus *Phidiana*, Gray, may be thus characterized:—

Phidiana, Gray.

Corpus gracilius, elongatum. Rhinophoria perfoliata; tentacula elongata. Papillæ dorsales in series obliquas confertas dispositæ. Podarium antice rotundatum vel subtruncatum.

Margo masticatorius mandibulæ singula serie denticulorum præditus. Radula paucidentata, dentibus uniseriatis armata.

This genus agrees, with regard to the structure of the rhinophoria, with the more remote genus *Antiopa*, as well as with *Flabellina*, Cuv., from which latter, however, it is easily distinguished by the bases of the papillæ and by the produced anterior corners of the foot in *Flabellina*; but the statements of Dr. Gray and Messrs. Alder and Hancock, as to the occurrence of lateral teeth in the latter genus, were not borne out by a more recent examination of this point in a new species, *Fl. Semperi*, Bgh. *Facelina*, Ald. & Hanc., is also easily distinguished by the produced corners of the foot. *Spurilla*, Bgh. (see the 'Transactions of the Royal Danish Society of Sciences,' vii. 1864, p. 205), forms an intervening link between *Phidiana* and the more typical Æolididæ, particularly *Æolidiella*, a new genus, comprising as yet four species (viz. *Æ. Sœmmeringii*, F. S. Leuckart, *Æ. occidentalis*, Bgh., n. sp., *Æ. glauca*, A. & H., *Æ. Alderi*, Cocks), and which may be thus characterized:—

Æolidiella, Bgh.

Forma corporis, rhinophoria, tentacula, papillæ et podarium ut in *Æolidiis* sensu strictiore.

* Extract from 'Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjöbenhavn' f. 1866.